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Does the Nobel Prize reflect current scientific and academic values?

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Abstract: This opinion paper puts forward arguments that reflect how science's most elite prize, the Nobel Prize may be, despite its grand stature, somewhat out of touch with the functionality of grassroots science. There is a disconnect between limited fields of study to which the prize is awarded and the interdisciplinary nature of complex research. This is the first weakness. The second limitation is the focus on a single individual, occasionally on two or three when the prize is divided, even though much research is frequently collaborative. This is particularly true in the biomedical and natural sciences, which tend to involve individuals with multiple skills, each or all of whom may be equally deserving of the Nobel Prize, given their collective participation. The Nobel Prize also tends to display poor cultural, linguistic and gender representation and/or bias. Finally, retractions of papers by select Nobel Prize laureates suggest that even these elite academics are not immune to the ills of science and academic publishing and that affect all scientists in a complex global web.

Keywords: citations and rewards, conflict and conflict resolution, controversy, fame, gender balance, polemic, recognition, stature and standing

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The Nobel Prize is thematically non-inclusive

Except perhaps for the highly politicized Nobel Peace Prize[1] or the Nobel Prize in literature, which might focus on organizations or individual efforts, all other categories of the Nobel Prize, which tends to cluster around a very limited number of fields of study[2], invariably involves some level of collaboration. The underlying nomination system accommodates academics that form part of the "Nobel population", but they are historically homogenous, with nearly all nominations being men from Europe and the USA[3]. To its credit, the focus of the Nobel Prize does take the multi- and interdisciplinary nature of research into consideration, and does consider many scientific disciplines and sub-disciplines, for example by focusing on a single "discovery" in physiology or medicine, or on new "methods" in physics and chemistry, as exemplified by the 2020 Nobel Prize for CRISPR, which was awarded as a chemistry prize, rather than as a medicine prize[4]. This suggests that the Nobel Prize, despite being awarded to in-

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[1] Ronald R. Krebs, "The False Promise of the Nobel Peace Prize", *Political Science Quarterly* 2009, Vol. 124(4), pp. 593–625 (https://doi.org/10.1002/j.1538–165X.2009.tb00660.x); Joshua Frye, Macy Suchan, "Nobel peace speech", *ESSACHESS – Journal for Communication Studies* 2017, Vol. 10(1), pp. 55–72 (https://nbn-resolving.org/urn: nbn: de: 0168-ssoar–52920–1, accessed: 23.02.2022).

[2] John P.A. Ioannidis, Ioana-Alina Cristea, Kevin W. Boyack, "Work honored by Nobel prizes clusters heavily in a few scientific fields", *PLoS ONE* 2020, Vol. 15(7), e0234612 (https://doi.org/10.1371/journal.pone.0234612).

[3] Marie Drobietz, Adrian Loerbroks, Nils Hansson, "Who is who in cardiovascular research? What a review of Nobel Prize nominations reveals about scientific trends", *Clinical Research in Cardiology* 2021, Vol. 110(12), pp. 1861–1870 (https://doi.org/10.1007/s00392–021–01813–2); Michael Pohar, Nils Hansson, "Between two stools? Pharmacologists nominated for Nobel prizes in 'physiology or medicine' and 'chemistry' 1901–1950 with a focus on John Jacob Abel (1857–1938)", *Naunyn-Schmiedeberg's Archives of Pharmacology* 2021, Vol. 394(3), pp. 503–513 (https://doi.org/10.1007/s00210–020–01993–0).

[4] Nils Hansson, Thorsten Halling, Heiner Fangerau, "Nobel nomination letters point to a winning formula", *Nature* 2018, Vol. 555(7696), 311 (https://doi.org/10.1038/d41586–018–03057-z).

dividuals that publish landmark studies[5], is thematically limited and non-inclusive because it fails to recognize other fields of science, arts and humanities that contribute to society, and subsequently fails to consider, recognize, or reward them equally.

Why are academics in the fields of natural sciences, engineering, environmental science, psychology, philosophy, mathematics, and so many other important fields of study[6] not given a fair and equal opportunity of being rewarded a Nobel Prize? By excluding them, through restrictive inclusionary principles, an intrinsic bias is introduced against intellectual novelty and discovery from many other worthy fields of study that cannot be rewarded a Nobel Prize simply because no such category exists for their consideration.

Weinberg and Galenson[7] claimed that the prime of conceptual laureates peaked at around the age of 25, or near 50 for experimental laureates. The cornerstone of the Nobel Prize venture, even today, continues to be the dictates of the will written by Alfred Nobel in the 1890's[8], and is still funded by the invested proceeds of his original wealth. However, should management of the will and its dictates be adjusted to reflect how modern research is carried out and to accommodate evolving value systems? Science already suffers from its share of inequity and elitism[9], but the failure of the Nobel Prize to accommodate a wider range of topics and more inclusive fields

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5 Yakub Sebastian, Chaomei Chen, "The boundary-spanning mechanisms of Nobel Prize winning papers", *PloS ONE* 2021, Vol. 16(8), e0254744 (https://doi.org/10.1371/journal.pone.0254744).

6 The Nobel Prize, section "Why isn't there a Nobel Prize in mathematics, engineering, biology or environmental science?", in: *FAQ – Frequently asked questions*, 2022 (https://www.nobelprize.org/frequently-asked-questions/, accessed: 23.02.2022).

7 Bruce A. Weinberg, David W. Galenson, "Creative Careers: The Life Cycles of Nobel Laureates in Economics", *De Economist* 2019, Vol. 167(3), pp. 221–239 (https://doi.org/10.1007/s10645–019–09339–9).

8 The Nobel Prize, *Alfred Nobel's will*, 2022 (https://www.nobelprize.org/alfred-nobel/alfred-nobels-will/, accessed: 23.02.2022); The Nobel Prize, *Full text of Alfred Nobel's will*, 2018 (https://www.nobelprize.org/alfred-nobel/full-text-of-alfred-nobels-will–2/, accessed: 23.02.2022).

9 Karen D. Pyke, "Institutional Betrayal: Inequity, Discrimination, Bullying, and Retaliation in Academia", *Sociological Perspectives* 2018, Vol. 61(1), pp. 5–13 (https://doi.org/10.1177/0731121417743816).

is disturbing since it reflects, in the author's opinion, an incoherence with today's science, culture and society. However, this is likely not a limitation or weakness of the Nobel Prize itself, but rather a result of limited opportunities for all within scientific communities.

This opinion paper thus reflects on whether the Nobel Prize reflects the true spirit of the collective academic enterprise, and if it is evolving sufficiently, and at a speed that is able to adjust to challenges and value systems in research and publishing that are rapidly changing.

Does the Nobel Prize fail to reflect current science's realities and challenges?

Casadevall and Fang[10], claiming that science's most elite prize of recognition might in fact not be "good for science", attempted to convey, by echoing the concerns of others prior to them, that the Nobel Prize does not, to some extent, represent the functionality and values of science today. The restricted selection of Nobel Prize laureates suggests that the boundaries of scientific discovery might lie in the hands of an elite few[11]. One underlying criticism of the Nobel Prize is the notion that a single individual can crown a laurel and receive a reward for what is often a group effort. After all, even Nobel laureates stand on the shoulders of other giants who preceded them, and rely on discoveries upon which their own discoveries have relied and been built. Not only, Duffin[12] argued that very few Nobel Prize-awarded discoveries really led to a "revolution" in science and medicine. The 2021 Nobel Prize in Physiology or

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[10] Arturo Casadevall, Ferric C. Fang, "Is the Nobel Prize good for science?", *FASEB Journal* 2013, Vol. 27(12), pp. 4682–4690 (https://doi.org/10.1096/fj.13–238758).

[11] Yifang Ma, Brian Uzzi, "Scientific prize network predicts who pushes the boundaries of science", *Proceedings of the National Academy of Sciences USA* 2018, Vol. 115(50), pp. 12608–12615 (https://doi.org/10.1073/pnas.1800485115).

[12] Jacalyn Duffin, "Commemorating excellence: The Nobel Prize and the Secular Religion of Science", in: N. Hansson, T. Halling, H. Fangerau (eds.), *Attributing Excellence in Medicine*, Clio Medica Online, Brill | Rodopi, Leiden 2019, pp. 17–38 (https://doi.org/10.1163/9789004406421_003).

Medicine was awarded on October 4, 2021 to two men (David Julius and Ardem Patapoutian) "for their discoveries of receptors for temperature and touch"[13], but the author wonders – without in any way attempting to diminish the excellence of that research – if the prize should not perhaps have been awarded to scientists who invented or perfected mRNA vaccines, which have been so central to the world's medical crisis in combatting the COVID–19 pandemic in late 2020 until now.

Importantly, in large collaborative research projects, a Nobel Prize laureate would likely not have achieved their success without the support of a team. If the Nobel Prize could allocated fair credit to deserving team members, it might be more meaningful to science and society[14]. Realistically, in large collaborative scientific projects, despite the involvement of sometimes large numbers of individuals, the intellectual origin of an advancement almost always originates from a limited number of participants, with the bulk of researchers collecting data or optimizing details of the work. Thus, even though it is important to recognize all of those involved in some way, they are not all equally deserving of the Nobel Prize. Yet, collectively, they are essential to the excellence of the research that is celebrated by the Nobel Prize. Another limitation of the Nobel Prize is the lack of recognition of competing groups that also likely conducted excellent research, emphasizing the narrow and elitist nature of the prize, and would benefit from a more inclusive approach that recognizes their efforts, even if as mentions, runners-up or sub-prizes. In other words, there are no silver medals in a Nobel Prize context[15].

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[13] The Nobel Prize, *Press release: The Nobel Prize in Physiology or Medicine 2021*, 2021 (https://www.nobelprize.org/prizes/medicine/2021/press-release/, accessed: 23.02.2022).

[14] Arturo Casadevall, Ferric C. Fang, "Is the Nobel Prize good…".

[15] Nils Hansson, Heiner Fangerau, Annette Tuffs, Igor J. Polianski, "No Silver Medal for Nobel Prize Contenders – Why Anesthesia Pioneers Were Nominated for but Denied the Award", *Anesthesiology* 2016, Vol. 125(1), pp. 34–38 (https://doi.org/10.1097/ALN.0000000000001099).

On whose shoulders are Nobel Prize laureate's careers built?

Compounding the fame factor attributed to a single Nobel Prize laureate, is the additional impact that this prize has on boosting citations of other papers by that individual, i.e., a retrospective-like Matthew Effect[16]. However, this is not always the case, as was observed for John C. Eccles, the 1963 co-Nobel Prize laureate alongside Alan L. Hodgkin and Andrew F. Huxley, whose citation pattern did not change much after receiving the prize[17]. Curiously, but not unexpectedly, the career paths of Nobel Prize laureates, prior to their prize-winning papers or receipt of the Nobel Prize itself, tend to be similar to those of other "regular" scientists, who often rely on collaborations[18].

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[16] Robert K. Merton, "The Matthew Effect in Science: The reward and communication systems of science are considered", *Science* 1968, Vol. 159(3810), pp. 56–63 (https://doi.org/10.1126/science.159.3810.56); Amin Mazloumian, Young-Ho Eom, Dirk Helbing, Sergi Lozano, Santo Fortunato, "How Citation Boosts Promote Scientific Paradigm Shifts and Nobel Prizes", *PLoS ONE* 2011, Vol. 6(5), e18975 (https://doi.org/10.1371/journal.pone.0018975); Ho Fai Chan, Laura Gleeson, Benno Torgler, "Awards before and after the Nobel Prize: A Matthew effect and/or a ticket to one's own funeral?", *Research Evaluation* 2014, Vol. 23(3), pp. 210–220 (https://doi.org/10.1093/reseval/rvu011); Rudolf Farys, Tobias Wolbring, "Matthew effects in science and the serial diffusion of ideas: Testing old ideas with new methods", *Quantitative Science Studies* 2021, Vol. 2(3), pp. 505–526 (https://doi.org/10.1162/qss_a_00129); Jaime A. Teixeira da Silva, "The Matthew Effect impacts science and academic publishing by preferentially amplifying citation, metrics and status", *Scientometrics* 2021, Vol. 126(6), pp. 5373–5377 (https://doi.org/10.1007/s11192–021–03967–2).

[17] Fabio De Sio, Nils Hansson, Ulrich Koppitz, "John C. Eccles' Conversion and the Meaning of 'Authority'", in: N. Hansson, T. Halling, H. Fangerau (eds.), *Attributing Excellence in Medicine*, Clio Medica Online, Brill | Rodopi, Leiden 2019, pp. 143–174 (https://doi.org/10.1163/9789004406421_009).

[18] Caroline S. Wagner, Edwin Horlings, Travis A. Whetsell, Pauline Mattsson, Katarina Nordqvist, "Do Nobel Laureates Create Prize-Winning Networks? An Analysis of Collaborative Research in Physiology or Medicine", *PLoS ONE* 2015, Vol. 10(7), e0134164 (https://doi.org/10.1371/journal.pone.0134164; Corrigendum: https://doi.org/10.1371/journal.pone.0136478); Jichao Li, Yian Yin, Santo Fortunato, Dashun Wang, "Scientific elite revisited: patterns of productivity, collaboration, authorship and impact", *Journal of the Royal Society Interface* 2020, No. 17, 20200135 (http://dx.doi.org/10.1098/rsif.2020.0135).

Not only do collaborations tend to decrease post-award[19], so does novelty when collaboration involves the same co-authors[20]. Even a percentage of Nobel laureates' papers remain uncited due to database omissions[21]. Bibliometric analyses of Nobel Prize laureates and their productivity and citation dynamics can be drawn from *curriculum vitae* and databases[22], but these need to be updated and accurate in order for them to be useful and informative[23]. Despite being Nobel Prize laureates, not many of them (2–17, depending on the bibliometric indicator) were highly ranked when compared with 6,000 top ranked scientists[24]. Despite their noble intentions, several of the bibliometric studies that attempted to quantify the output and describe the trends of Nobel Prize laureates and/or their published papers feed into the ills of the metrics-based rewards schemes that creates such elites (and elite journals) in the first place[25]. The author believes that the Nobel Prize needs to move

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[19] Ho Fai Chan, Ali Sina Önder, Benno Torgler, "Do Nobel laureates change their patterns of collaboration following prize reception?", *Scientometrics* 2015, Vol. 105(3), pp. 2215–2235 (https://doi.org/10.1007/s11192–015–1738–8).

[20] Eidem, "The first cut is the deepest: repeated interactions of coauthorship and academic productivity in Nobel laureate teams", *Scientometrics* 2016, Vol. 106(2), pp. 509–524 (https://doi.org/10.1007/s11192–015–1796-y).

[21] Petr Heneberg, "Supposedly uncited articles of Nobel laureates and Fields medalists can be prevalently attributed to the errors of omission and commission", *Journal of the American Society for Information Science and Technology* 2013, Vol. 64(3), pp. 448–454 (https://doi.org/10.1002/asi.22788).

[22] Jichao Li, Yian Yin, Santo Fortunato, Dashun Wang, "A dataset of publication records for Nobel laureates", *Scientific Data* 2019, No. 6, 33 (https://doi.org/10.1038/s41597–019–0033–6).

[23] Jaime A. Teixeira da Silva, Judit Dobránszki, Aceil Al-Khatib, Panagiotis Tsigaris, "*Curriculum vitae*: challenges and potential solutions", *KOME* 2020, Vol. 8(2), pp. 109–127 (https://doi.org/10.17646/KOME.75672.52).

[24] Marek Kosmulski, "Nobel laureates are not hot", *Scientometrics* 2020, Vol. 123(1), pp. 487–495 (https://doi.org/10.1007/s11192–020–03378–9).

[25] Jaime A. Teixeira da Silva, "Citations and Gamed Metrics: Academic Integrity Lost", *Academic Questions* 2021, Vol. 34(1), pp. 96–99 (https://doi.org/10.51845/34s.1.18).

away from this unhealthy trend, or adopt a new philosophy. Peer pressure, such as the use of social media, is a powerful vehicle that could force such change[26].

Schlagberger, Bornmann, and Bauer[27] found that over a 21-year period (1994–2014), the vast majority of 155 Nobel Prize laureates from the fields of chemistry, physics, and physiology or medicine were from the USA, and even from within the USA[28], and most were associated with UC Berkeley, Columbia University and Massachusetts Institute of Technology. This geographically extremely skewed award[29] thus reflects a poor cultural, geographic and/or linguistic representation.

Are Nobel Prize laureates untouchables?

As already noted above, the Nobel Prize, science's most elite prize, is awarded to an infinitesimally small percentage of the scientific community, and while academics can to some extent benefit from the magnanimous aura that this prize confers all of science, they themselves are left in the shadows of a few dozen academics in their field that are projected as "greater" than them. However, even as these elites gradually become more distant from academia's battles and struggles, so too might they be touched by their own research flaws, and by the increasingly hawkish nature of a corrective narrative in academic publishing, as evidenced by the retraction of a paper[30] by the 2018 Nobel

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[26] Suntosh R. Pillay, "The revolution will not be peer reviewed: (creative) tensions between academia, social media and anti-racist activism", *South African Journal of Psychology* 2020, Vol. 50(3), pp. 308–311 (https://doi.org/10.1177/0081246320948369).

[27] Elisabeth Maria Schlagberger, Lutz Bornmann, Johann Bauer, "At what institutions did Nobel laureates do their prize-winning work? An analysis of biographical information on Nobel laureates from 1994 to 2014", *Scientometrics* 2016, Vol. 109(2), pp. 723–767 (https://doi.org/10.1007/s11192–016–2059–2).

[28] Harriet Zuckerman, *Scientific elite. Nobel laureates in the United States*, Free Press, New York 1977.

[29] Nils Hansson, "What's so special about the Nobel Prize?", *Public Understanding of Science* 2018, Vol. 27(4), pp. 485–488 (https://doi.org/10.1177/0963662518765503).

[30] Inha Cho, Zhi-Jun Jia, Frances H. Arnold, "Site-selective enzymatic C–H amidation for synthesis of diverse lactams", *Science* 2019,

Prize in Chemistry, Frances H. Arnold[31]. In that particular case, the retraction was hailed as a positive gesture towards fortifying attitudes that would encourage the correction of the literature[32]. One of the harsh realities of current scientific research is that the discovery of flaws or errors in a paper at the post-publication peer review stage may lead to reputational harm or taint the legendary status, even of Nobel Prize laureates. As one example, a paper by Sir Martin Evans, a 2007 Nobel Prize laureate in medicine, received an expression of concern[33].

Thus, Nobel Prize laureates, are not untouchable, nor are they immune to science's current state of intense corrective reform. Despite this, corrective measures associated with the Nobel Prize seem to be out of sync with those currently reforming academic publishing. This is because a Nobel Prize cannot be withdrawn, i.e., an award is definitive. Even if there is a challenge, the award cannot be revoked, reversed, or retracted: "The decision is final and without appeal"[34], and "according to the Statutes of the Nobel Foundation, § 10, 'No appeals

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Vol. 364(6440), pp. 575–578 (https://doi.org/10.1126/science.aaw9068); Retraction: *Science* 2020, Vol. 367(6474), 155 (https://doi.org/10.1126/science.aba6100).

[31] Bruce Y. Lee, *Nobel Prize Winner Frances Arnold Retracts Paper, Here Is The Reaction*, 2020 (https://www.forbes.com/sites/brucelee/2020/01/05/nobel-prize-winner-frances-arnold-retracts-paper-here-is-the-reaction/, accessed: 23.02.2022).

[32] Jaime A. Teixeira da Silva, "A Synthesis of the Formats for Correcting Erroneous and Fraudulent Academic Literature, and Associated Challenges", *Journal for General Philosophy of Science* 2022 (in press) (https://doi.org/10.1007/s10838–022–09607–4).

[33] Kyriakos Anastasiadis, Polychronis Antonitsis, Stephen Westaby, Ajan Reginald, Sabena Sultan, Argirios Doumas, George Efthimiadis, Martin John Evans, "Editorial Expression of Concern: Implantation of a Novel Allogeneic Mesenchymal Precursor Cell Type in Patients with Ischemic Cardiomyopathy Undergoing Coronary Artery Bypass Grafting: An Open Label Phase IIa Trial", *Journal of Cardiovascular Translational Research* 2021, Vol. 14(3), pp. 587–588 (https://doi.org/10.1007/s12265–020–10076–7).

[34] The Nobel Prize, section "What does the nomination process look like from start to finish?", in: *Questions and answers about the nomination process for a Nobel Peace Prize*, 2016 (https://www.nobelprize.org/nomination/questions-and-answers-about-the-nomination-process-for-a-nobel-peace-prize/, accessed: 23.02.2022).

may be made against the decision of a prize-awarding body with regard to the award of a prize'."[35] How erroneous Nobel laureate literature is handled and perceived, via a bibliometric analysis of their corrections and retractions, would certainly be a worthwhile future scholarly endeavor.

The Nobel Prize Commission should consider that the status of an author or paper is not set in stone in academic and biomedical science publishing. Since a Nobel Prize is often awarded in recognition of academic achievement that derives from scientific papers, the academic status, career, and papers of a Nobel Prize laureate are intricately linked. Occasionally, scientific legends may fall, and their papers may be retracted, ultimately annulling their findings and use[36]. Even Nobel Prize laureates, who might believe that this prize provides them with an ethical or moral layer of protection (in the case of the Nobel Peace Prize) and bubble of immunity, are not immune to the phenomenon of "reversal of decisions" (retractions) that have become a central part of science and academic publishing. The Nobel Prize laureate (2004 Nobel Prize in Physiology or Medicine) Linda B. Buck experienced this a decade or more ago[37]. In contrast, the Arnold experience in 2020 carried a positive take-away message[38]. If a Nobel Prize is awarded based on the merit of an invention, discovery, or philosophical breakthrough, but is found to be the product of misconduct, fraud or falsified science, there does not seem to be any moral defense to continue to award and reward that scientist with

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[35] The Nobel Prize, section "Is it possible to revoke a Nobel Prize?", in: *FAQ – Frequently asked questions*, 2022 (https://www.nobelprize.org/frequently-asked-questions/, accessed: 23.02.2022).

[36] Jaime A. Teixeira da Silva, Judit Dobránszki, Aceil Al-Khatib, "Legends in Science: from Boom to Bust", *Publishing Research Quarterly* 2016, Vol. 32(4), pp. 313–318 (https://doi.org/10.1007/s12109–016–9476–1).

[37] Heidi Ledford, "Nobel prizewinner's paper retracted", *Nature* 2008, No. 452, 13 (https://doi.org/10.1038/452013a).

[38] Gemma Conroy, *Scientists reveal what they learnt from their biggest mistakes*, 2020 (https://www.natureindex.com/news-blog/scientists-reveal-what-they-learnt-from-their-biggest-mistakes, accessed: 23.02.2022).

this prize, or its reward money, despite the rigid stipulations of Alfred Nobel's will.

Would Alfred Nobel have wanted his award to be attributed to science derived from, or a scientist engaging in, misconduct or fraud, or, in the case of the Peace Prize, to a person engaging in war? The retrospective retraction of a science prize, in the face of misconduct, is not without precedent, for example the revocation of Olivier Voinnet's 2009 EMBO Gold Medal.[39] The Nobel Prize Commission thus needs to reform the rules of the Nobel Prize by reconsidering the continued award of Nobel Prizes to individuals engaging in questionable ethical or moral practices, and to reflect on the ability to withdraw a Nobel Prize – superpositional to Alfred Nobel's will – should a Nobel Prize laureate have committed academic misconduct, post-publication and even post-mortem, when they still carry responsibilities beyond the grave[40]. The Nobel Foundation should reflect on modern scientific publication practices, and adjust to them, or suffer potential reputational consequences for its lack of adaptation.

Should the 2019 Nobel Prize be withdrawn?

The 2019 Nobel Peace Prize, the 100th such prize, was awarded to Ethiopia's Prime Minister, Abiy Ahmed Ali, in recognition of his efforts in 2018 to draw peace in the Horn of Africa, i.e., between Ethiopia and Eritrea.[41] However, those efforts at peace between neighboring countries may have been undone, in late 2020 and 2021, by the military attacks and declaration of war by Ethiopia's federal troops against the Tigray People's Liberation Front of the break-away Tigray province within Ethiopia itself,

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39 EMBO, *Gold Medal*, n.d. (https://web.archive.org/web/20201020114654/https://www.embo.org/funding-awards/gold-medal.html, accessed: 23.02.2022).

40 Jaime A. Teixeira da Silva, Judit Dobránszki, "The authorship of deceased scientists and their posthumous responsibilities", *Science Editor (CSE)* 2015, Vol. 38(3/4), pp. 98–100.

41 The Nobel Prize, *The Nobel Peace Prize 2019*, 2022 (https://www.nobelprize.org/prizes/peace/2019/summary/, accessed: 23.02.2022).

on the northern border with Eritrea[42].

Ethiopia was said to have aligned with Eritrea's dictator, namely Eritrea's president Isaias Afwerki, with whom a peace pact had been struck in 2018, earning Ali his Nobel Peace Prize, but who has now become Ethiopia's war ally.[43] How can the use of fighting and war that also triggered a humanitarian crisis with the flood of tens of thousands of people into Sudan, a neighboring country, justify the continued attribution of the Nobel Peace Prize to Ethiopia's Prime Minister?

Evidently, war is antithetic to peace, and the rigid position held by the Nobel Prize Committee – which itself is deeply politicized – that a Nobel Peace Prize or any other Nobel Prize cannot be withdrawn, surely needs to change. As equally as a Nobel Prize winner's paper may be retracted from the literature[44], so too should a Nobel Prize be retracted or withdrawn if the values of the prize winner change, e.g., the use of war by a Nobel Peace Prize laureate, who supposedly espouses peace to resolve conflicts. In this case, what is the moral basis to justify retaining the Nobel Peace Prize?

Other issues and conclusion

The Nobel Prize has been noted as being strongly gender-biased[45], and overwhelmingly over-rewards men, or under-rewards women[46], mirroring – albeit more acutely – a similar trend

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[42] A.O. Jima, "Vicious circle of Ethiopian politics: Prospects and challenges of current political reform", *Cogent Social Sciences* 2021, Vol. 7(1), 1893908 (https://doi.org/10.1080/23311886.2021.1893908).

[43] Daniel Haile, *Africa's Rasputin: Why Eritrea's Isaias Afwerki Has Joined Ethiopia's Civil War*, 2020 (https://nationalinterest.org/blog/buzz/africa%E2%80%99s-rasputin-why-eritrea%E2%80%99s-isaias-afwerki-has-joined-ethiopia%E2%80%99s-civil-war–172764, accessed: 23.02.2022).

[44] Inha Cho, Zhi-Jun Jia, Frances H. Arnold, "Site-selective enzymatic C–H amidation…".

[45] Nils Hansson, Heiner Fangerau, "Female physicians nominated for the Nobel Prize 1901–50", *The Lancet* 2018, Vol. 391(10126), pp. 1157–1158 (https://doi.org/10.1016/S0140–6736(18)30576–2).

[46] Per Lunnemann, Mogens H. Jensen, Liselotte Jauffred, „Gender bias in Nobel prizes", *Palgrave Communications* 2018, No. 5, 46 (https://doi.org/10.1057/s41599–019–0256–3).

in science overall[47]. These aspects suggest that the platform for this prize needs to evolve to adapt to a science that reflects the current dystopian state of academia, rather than a utopian out-of-reach goal that the vast majority of academics will never achieve. A new prism is thus required for rewarding success in science that lies beyond the Nobel Prize.

Conflicts of interest and disclaimer

The author declares no conflicts of interest of relevance to this topic.

Author contributions

The author contributed fully to the intellectual discussion underlying this paper, literature exploration, writing, reviews and editing, and accept responsibility for the content, analyses and interpretation herein.

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[47] Ho Fai Chan, Benno Torgler, "Gender differences in performance of top cited scientists by field and country", *Scientometrics* 2020, Vol. 125(3), pp. 2421–2447 (https://doi.org/10.1007/s11192–020–03733-w).

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